

Specification

1. Name of Invention

The manufacture method of a resin fabrication object

2. Claim

(1) the thermoplastic resin which is the manufacture method of a resin fabrication object of coming to have a substrate in the resin machine inside of the body, and has predetermined melting point and predetermined adhesive strength in the whole field which touches the resin machine object of the above-mentioned substrate -- covering -- this substrate -- a metallic mold -- an inner predetermined position -- setting up -- this -- a metallic mold -- the manufacture method of the resin fabrication object characterized by to eject resin inside and to really fabricate the above-mentioned substrate with this resin to it

3. Detailed Explanation of Invention

[Field of the Invention]

This invention relates to the manufacture method of a resin fabrication object of coming to have a substrate in the resin machine inside of the body.

[The conventional technology]

Hereafter, taking the case of an integrated circuit card, it explains as a resin fabrication object.

An integrated circuit card can be used instead of a money card with the conventional magnetic stripe etc. here, the piece of a semiconductor of Memory IC, CPU, and others can be harbored inside to the basis inside of the body of a card, and the mass memory capability of several or more figures can be given compared with the conventional card with a magnetic stripe, and also arbitrary operation functions can be given.

Fig. 2 is a cross-sectional composition figure showing the principal part of such an integrated circuit card, and is set to a figure

The card machine object with which 6 comes to fabricate resin, such as vinyl chloride, the printed circuit board by which 2 was contained in this card machine object 6 (it is described as Following PCB),

10 is ten modules which adhered on this PCB2, and this consists of a yellowtail coat part 4 which carries out resin sealing of the IC tip 1, wiring 3, and the above-mentioned IC tip 1 and wiring 3 of Memories IC and CPU etc.

This IC module 10 and PCB2 to which this adhered are described as PCB2 with IC module.

Moreover, the lamination film with which 5a and 5b were formed in both sides of the above-mentioned card machine object 6, and 7 are

point-of-contact parts with a card reader.

Next, the conventional manufacture method of the above-mentioned integrated circuit card is explained according to Fig. 3.

As first shown in Fig. 3 (a), on PCB2, IC tip 1 grade is mounted, the yellowtail coat of these is carried out by the epoxy resin etc., and the IC module 10 is formed.

On the other hand, as shown in Fig. 3 (b), the card machine object 6 which has a recess 6a by which above-mentioned PCB2 with IC module is contained is formed by ejection fabrication.

And the IC module 10 is inserted in the recess 6a of this card machine object 6, and both are pressed, it pastes up, and an integrated circuit card as shown in Fig. 2 is formed.

[Problem which invention tends to solve]

However, in order that accuracy may improve the thickness size of a card, and in order to generate a crevice or for a level difference not to arise on the surface in an engaging portion of PCB2 and a base 6 by the above manufacture methods of the conventional integrated circuit card, it is necessary to finish each of PCB2 and the base 6 with sufficient accuracy, and the manufacture is difficult.

Especially the thing for which the precoating part 4 of the IC module 10 is made into a desired form size had the problem that an accurate integrated circuit card could not be obtained, by the conventional manufacture method very difficult therefore.

Furthermore, it is made to paste up PCB2 with IC module, and the card machine object 6 with an adhesion sheet by the conventional manufacture method, and the adhesion intensity is low and lacking also in durability.

Moreover, when both sides were pasted up and the crevice was generated into the engaging portion, water etc. might invade from there, the adhesion portion might exfoliate, and there was a problem that the reliability of a card was low.

This invention aims at offering the manufacture method of a resin fabrication object that a reliable resin fabrication object can be acquired while it was made in view of this point, and manufacture of resin fabrication objects, such as an integrated circuit card, compares with the former and becomes very easy.

[the means for solving a problem]

-- the substrate by which coating was carried out by the thermoplastic resin which has a melting point and adhesive strength with the suitable manufacture method of the resin fabrication object concerning this invention -- a metallic mold -- an inner predetermined position -- setting up -- this -- a metallic mold -- resin is ejected inside and the above-mentioned substrate is really formed in it with this resin

[Action]

The time of carrying out ejection fabrication of the resin machine
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objects, such as a card machine object in an integrated circuit card, in this invention -- a metallic mold -- since it is not necessary to finish both with high precision like before, and manufacture becomes easy, since the substrate which carried out coating of the surface by thermoplastic resin is installed inside and this substrate is really fabricated, and the above-mentioned thermoplastic resin moreover acts as adhesives -- the above-mentioned resin machine object and a substrate -- an adhesion process -- nothing -- firmly -- incidentally it pastes up

[Case of the operation]

Hereafter, the case of the operation of this invention is explained about a figure.

the time of Fig. 1 being a figure showing the manufacture method of the resin fabrication object by one case of the operation of this invention, and this case-of-the-operation method carrying out ejection fabrication of the card machine object in manufacture of an integrated circuit card -- a metallic mold -- PCB with IC module to which coating of the thermoplastic resin was carried out is installed on the surface inside, and this PCB is really fabricated

Here, the equipment for realizing the manufacture method of this case of the operation is briefly explained using Fig. 1.

in Fig. 1 (b), as for 11 and 12, the recesses 11a and 12a were fabricated by the central part, respectively -- the upper -- a metallic mold and the Shimokane type -- it is -- this -- both -- when metallic molds 11 and 12 are registered, the space of the shape of the card machine object 13 and isomorphous is formed of both the recesses 11a and 12a

and above-mentioned Shimo -- the hole for adsorption to the part where PCB2 with IC module is laid in a metallic mold 12 -- 12b prepares -- having -- ,A, -- this adsorption -- a hole -- 12b is connected to the vacuum pump (not shown)

In addition, 14 is a pouring mouth with which the resin for card machine object fabrication is poured in.

Next, the manufacture method of this case of the operation is explained in detail according to Fig. 1 (a) - (c).

First, as shown in Fig. 1 (a), coating of the thermoplastic resin, such as hot melt adhesives which have suitable melting point and suitable adhesive strength for the whole field which touches the card machine object of PCB2 with IC module, is carried out thinly. And this PCB2 with IC module is laid in a predetermined position. and a vacuum pump is operated -- making -- the object for adsorption -- a hole -- suction fixation of above-mentioned PCB2 with IC module is carried out through 12b

in this state, it is shown in Fig. 1 (b) -- as -- the upper -- package resin, such as thermoplastic resin, is ejected from the pouring mouth 14 in a model by the plunger which does not register and illustrate metallic mold 11 and Shimokane type 12, and PCB2 with IC module is really fabricated with this resin

Here, if the resin usually used for ejection fabrication contains

the separator agent, therefore it is a direct resin machine object and really going to fabricate PCB2 with IC module, there is a possibility that both adhesion intensity may become small.

However, in this case of the operation, since coating of the thermoplastic resin for adhesion is carried out to the whole field which touches the card machine object of PCB2 as mentioned above and it really fabricates, this resin is molten at the time of ejection fabrication, and, thereby, the adhesion nature of PCB2 and a card machine object improves.

And the card machine object 13 which separated the model after predetermined time and was really fabricated is taken out, and as shown in Fig. 1 (c), the lamination films 5a and 5b for makeup are stuck on both sides of this card machine object 13.

according to such this case of the operation -- PCB2 with IC module -- a metallic mold -- since it sets inside and was [card-] made toize by ejection fabrication at one shot, the adhesion process of the IC module and the card board in the conventional manufacture method can be skipped

Moreover, what is necessary is just to manage the necessity of making highly precise each size of the IC module 10 and the card machine object 13 (metallic mold) like before so that it completely may not be and IC module may merely become less than the thickness of the card machine object 13 since this size error can such really be covered with resin according to formation even if a size error is in the IC module 10.

Especially, since accuracy is unnecessary in the size of the precoated part 4 of the IC module 10, the manufacture becomes very easy compared with the former, and can aim at a large cost cut.

Moreover, since the adhesion nature of PCB2 and the card machine object 13 improves, adhesion intensity increases remarkably, since according to such a manufacture method the adhesion intensity of PCB2 and the card machine object 6 carries out ejection fabrication after it compares it with the conventional adhesion sheet and it not only becomes large, but it carries out coating of the thermoplastic resin for adhesion to PCB2, and a crevice moreover is not generated in both engaging portions, the reliability of the card improves remarkably.

Furthermore, conventionally, although the form of the card machine object 13, i.e., a metallic mold, needed to be deflected according to it when the form of the IC module 10 and PCB2 differed with equipment, unless the form of the whole integrated circuit card is changed, in this case of the operation, all can be manufactured by the common metallic mold.

In addition, although the above-mentioned case of the operation explained the case where PCB with IC module was really fabricated on some card machine objects, this of your making it really fabricate all over one side of a card machine object is natural. Moreover, PCB -- not only the Shimokane type -- the upper -- a met

allic mold -- installing -- you may make -- further -- PCB -- a spacer etc. -- minding -- both -- you may make it install in the middle of a metallic mold

Moreover, although the above-mentioned case of the operation explained the case where this invention was applied to the manufacture method of an integrated circuit card, this invention is applicable to all the manufacture methods of a resin fabrication object that come to have a substrate in the resin machine inside of the body.

[The effect of invention]

As mentioned above, according to this invention, it sets to the manufacture method of a resin fabrication object of coming to have a substrate in the resin machine inside of the body.

the this board after carrying out coating of the thermoplastic resin for adhesion to the above-mentioned substrate -- a metallic mold -- inside -- setting up - this metallic mold, since resin is ejected inside and the above-mentioned substrate was really fabricated with this resin to it

While it compares with the former and manufacture becomes very easy, the adhesion intensity of a substrate and a resin machine object becomes remarkably large, and has the effect which can improve remarkably the reliability of the resin fabrication object manufactured by this.

4. Brief Explanation of the Drawings

Fig. 1 (a) or (c) is a figure for explaining the manufacture method of the integrated circuit card by one case of the operation of this invention, Fig. 2 is a common cross-sectional composition figure of an integrated circuit card, and Fig. 3 (a), and (b) is a figure explaining the manufacture method of the conventional integrated circuit card.

2 [-- It is a metallic mold and 12 a top. / -- The Shimokane type, 13 / -- A card machine object, 15 / -- Thermoplastic resin for adhesion.] -- A printed circuit board (PCB), 10 -- IC module, 11

In addition, a same-among figure mark shows the same or a considerable portion.